

**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

Noritaka MURAKI

Appln. No.: 10/586,909

Confirmation No.: 1815

Filed: January 8, 2007

Docket No: Q79714

Group Art Unit: 2892

Examiner: Robert T. HUBER

For: GALLIUM NITRIDE-BASED COMPOUND SEMICONDUCTOR LIGHT-  
EMITTING DEVICE

**STATEMENT OF SUBSTANCE OF INTERVIEW**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Please review and enter the following remarks summarizing the interview conducted on December 20, 2011:

**REMARKS**

An Examiner's Interview Summary Record (PTO-413) is dated December 29, 2011.

**During the interview, the following was discussed:**

The rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Kim (U.S. Patent No. 6,995,389) in view of Yamada (U.S. Patent No. 6,608,330), Sasaoka (U.S. Patent Application Publication No. 2003/0042496), and Stintz (U.S. Patent Application Publication No. 2002/0114367), based on the arguments in the Amendment filed December 7, 2011.

Brief Identification of principal arguments:

A. Kim does not teach a light-emitting layer which is comprised of a multiple quantum well structure formed of a barrier layer and a well layer, wherein each and all of the individual gallium nitride compound semiconductor well layers of the multiple quantum well structure have the same composition, as claimed. This is because the light-emitting layer of Kim comprises the quantum well structure which includes all of the layers 12, 13, and 14, wherein the reservoir layers 12 and well layers 14 differ in composition.

B. Kim discloses that the barrier layers have a thickness of 20 angstroms or less and the quantum well layers 14 have a thickness between 5 and 100 angstroms. (Col. 3, lines 28-33). Kim does not describe that the well layers have a thickness less than 1.5 nm, or that the well layer 14 has a thick portion and a thin portion, as claimed.

C. Kim discloses a dopant concentration of the reservoir layer between  $5 \times 10^{16} \text{ cm}^{-3}$  and  $5 \times 10^{19} \text{ cm}^{-3}$ . (Col. 3, lines 38-40). Kim does not teach that the barrier layer is doped at a density of between  $5 \times 10^{16} \text{ cm}^{-3}$  and  $5 \times 10^{19} \text{ cm}^{-3}$ , as claimed.

D. Yamada discloses that the light emitting efficiency of a light emitting device becomes higher as flatness or crystallinity of the growing side of the well layer become better. (Col. 4, lines 16-20). However, when an interaction works between the 1st well layer and the 2nd well layer, and when the 1st and 2nd well layers emit light of different wavelengths, Yamada explains that some asperity of the well layers affects the desirable light emitting efficiency. The well layer 14 of Kim has a homogeneous composition so that each well layer emits a light of the same wavelength. Therefore, if the well layer of Yamada is applied to the device of Kim, as proposed by the Examiner, it is apparent to those skilled in the art that the light emitting efficiency will be negatively affected. It would not have been obvious to modify/combine Yamada and Kim.

Results of Interview:

A. The Examiner disagreed with arguments (A)-(C), but stated that he considered the rejection to be overcome based on the argument (D).

B. The Examiner would further consider, update the prior art search, and propose allowable subject matter.

It is respectfully submitted that the instant STATEMENT OF SUBSTANCE OF INTERVIEW complies with the requirements of 37 C.F.R. §§1.2 and 1.133 and MPEP §713.04.

**It is believed that no petition or fee is required.** However, if the USPTO deems otherwise, Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee and the Publication Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,

/ Marina V. Zalevsky /

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